What is claimed is:

1. An optical switch comprising:

a reflective mirror shutter connected to a shutter beam and buckle beam springs;

a set of suspended buckle beam springs connected to said movable shutter beam and with two ends anchored onto a substrate; and,

a shutter beam connected to at least one moveable translation link and which is movable with respect to the stationary portion of said substrate in response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this shutter beam;

characterized in that, said V-beam actuators consist at least two sets of

movable V-beams suspended on the substrate with two ends anchored onto said substrate, and connected to a link beam structure for pushing and pulling the movement translation link, thereby said shutter beam is moved by said V-beam actuators; it also comprises fiber optics for handling the input and output optical signals.

2. The optical switch as claimed in claim 1, wherein a moveable translation mechanism of the optical switch comprises at least one moveable translation link structure connected to the end of said shutter beam, and movement of this said moveable translation link structure link with displacement of V-beam actuator via spatial joint; thereby said V-beam actuators push and pull the shutter beam with buckle beam springs to move from one stable position to the other stable position in terms of moveable translation mechanism, and bi-stable switching function of optical switch is achieved.
3. The optical switch as claimed in claim 1, wherein said V-beam actuators of said optical switch comprises at least two sets of V-beam actuators with opposite moving direction arranged with layout configuration that their arched-directions of said two sets of V-beam actuators are parallel along with a line in an opposite way, and both ends of said V-beam actuators are anchored to the substrate, while V-beams are centered with a link beam

structure; and the forward moving displacement generated by the V-beam actuator produces push action and pull action to the moveable translation link depending on the spatial layout configuration.

4. An optical switch comprising:

a reflective mirror shutter connected to a shutter beam and buckle beam springs;

two sets of suspended buckle beam springs connected to said movable shutter beam on both sides of the shutter beam and with two ends anchored onto a substrate; wherein the reflective mirror shutter is arranged on the shutter beam located between the two sets of connection points of said suspended buckle beam springs to shutter beam;

a shutter beam connected to two moveable translation links at its ends and is movable with respect to the stationary portion of said substrate in response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this said shutter beam;

characterized in that, two sets of movable V-beams are suspended on the substrate with two ends anchored onto said substrate and located at both sides of shutter beam, and each sets of V-beam connected to a link beam structure for pushing the movement translation link toward the direction along with the arched-direction regarding the relative V-beam, thereby said shutter beam is moved by said V-beam actuators;

it also comprises fiber optics for handling input and output optical signal.

5. The optical switch as claimed in claim 4, wherein the moveable translation mechanism of said optical switch comprises two moveable translation link structures connected at both ends of said shutter beam, and movement of this said moveable translation link structure link with displacement provided by one of the V-beam actuator set located at both sides via spatial joint at both sides; thereby said V-beam actuators push the shutter beam with buckle beam springs to move from one stable position to another stable position in terms of moveable translation mechanism, and then the bi-stable switching function of optical switch is achieved; and said V-beam actuators of said optical switch comprise two sets of V-beam actuators located at both sides of shutter beam, and each V-beam actuator connected to the shutter beam in terms of spatial joint which comprises link beam connected to V-beam actuator and moveable translation link connected to shutter beam; the two sets of V-beam actuators with opposite moving direction arranged with layout configuration that their arched-directions of said two sets of V-beam actuators are parallel along with a line in an opposite way, and their arched-directions are toward the shutter beam and reflective mirror shutter; and the forward moving displacement generated by the V-beam actuator makes the push action to the moveable translation link to enable the shutter beam and reflective mirror shutter move from the initial stable position to the second

stable position.

6. The optical switch as claimed in claim 4, wherein a moveable translation mechanism of said optical switch comprises two moveable translation link structures connected at both ends of said shutter beam, and the movement of said moveable translation link structure link with displacement is provided by one of said V-beam actuators located at both sides via spatial joint at both sides; thereby said V-beam actuators pull the shutter beam with buckle beam springs to move from one stable position to the other stable position in terms of movement translation mechanism, and the bi-stable switching function of optical switch is then achieved; and the V-beam actuators of said optical switch comprises two sets of V-beam actuators located at both sides of shutter beam, and each V-beam actuator connected to the shutter beam in terms of spatial joint which comprises link beam connected to V-beam actuator and movement translation link connected to shutter beam; said two sets of V-beam actuators with opposite moving direction arranged with layout configuration that their arched-directions of said two sets of V-beam actuators are parallel along with a line in an opposite way, and their arched-directions are outward the shutter beam and reflective mirror shutter; and the forward moving displacement generated by the V-beam actuator makes pull action to the moveable translation link to enable the shutter beam and reflective mirror shutter move from the

initial stable position to the second stable position.

7. The optical switch as claimed in claim 4, wherein the operation state of the optical switch regarding input optical signals is transmitted forward to output channels at the initial state and switch-off state for the optical switch, and the input optical signals is reflected by said reflective mirror shutter toward output channels at the second stable state and switch-on state for the optical switch.

8. The optical switch as claimed in claim 4, wherein the operation state of the optical switch regarding input optical signals is reflected by said reflective mirror shutter toward output channels at the initial state and switch-off state for said optical switch, and the input optical signals is transmitted forward to output channels at the second stable state and switch-on state for the optical switch.

9. An optical switch comprising:

a reflective mirror shutter connected to a shutter beam and buckle beam springs;

two sets of suspended buckle beam springs connected to said movable shutter beam and with two ends anchored onto a substrate, where the reflective mirror shutter is arranged on one end of the shutter beam; and

a shutter beam connected to a moveable translation link at its end and which is movable with respect to the stationary portion of said substrate in

response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this shutter beam;

characterized in that, two sets of movable V-beams are suspended on the substrate with two ends anchored onto said substrate and located at both sides of shutter beam, and each sets of V-beam is connected to a link beam structure for pushing and pulling the movement translation link move along with the arched-direction regarding the relative V-beam sets, thereby said shutter beam is moved by said V-beam actuators; it also comprises fiber optics for handling the input and output optical signals.

10. The optical switch as claimed in claim 9, wherein a moveable translation mechanism of the optical switch comprises a moveable translation link structure at one end of said shutter beam, and the movement is provided by one set of the two V-beam actuator sets via link beam; while the separate moveable translation link and two link beams of two sets of V-beam actuators form a spatial joint; thereby one set of V-beam actuators push the shutter beam with buckle beam springs to move from one initial stable position to the second stable position in terms of moveable translation mechanism; furthermore, the other set of V-beam actuators pull the shutter beam with buckle beam springs to move from the second stable position back to the initial stable position in terms of moveable translation mechanism, then the bi-stable switching function of optical switch is

achieved; in addition, the V-beam actuators of the optical switch comprise two sets of V-beam actuators separately located at one side of shutter beam, and each V-beam actuator set is connected to a link beam, while the forward moving displacement generated by one set of the two sets of V-beam actuators produces push and pull action to the moveable translation link via said link beam to enable the shutter beam and reflective mirror shutter move from one stable position to another stable position.

11. The optical switch as claimed in claim 9, wherein the operation state of the optical switch regarding input optical signals is transmitted forward to output channels at the initial state and switch-off state for the optical switch, and the input optical signals is reflected by said reflective mirror shutter toward output channels at the second stable state and switch-on state for the optical switch.

12. The optical switch as claimed in claim 9, wherein the operation state of the optical switch regarding input optical signals is reflected by said reflective mirror shutter toward output channels at the initial state and switch-off state for said optical switch, and the input optical signals is transmitted forward to output channels at the second stable state and switch-on state for the optical switch.

13. An optical switch comprising:

a reflective mirror shutter connected to a shutter beam and buckle beam

springs;

two sets of suspended buckle beam springs connected to said movable shutter beam and with two ends anchored onto a substrate; wherein the reflective mirror shutter is arranged on one end of the shutter beam;

a shutter beam connected to a moveable translation link at its end and is movable with respect to the stationary portion of said substrate in response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this said shutter beam;

characterized in that, two sets of movable V-beams are suspended on the substrate with two ends anchored onto said substrate and located at one side of shutter beam, and each sets of V-beam connected to each other via a link beam structure for pushing and pulling the moveable translation link moving along with the arched-direction regarding the relative V-beam sets, thereby said shutter beam is moved by said V-beam actuators; it also comprises fiber optics for handling the input and output optical signal.

14. The optical switch as claimed in claim 13, wherein a moveable translation mechanism of said optical switch comprises a moveable translation link structure at one end of said shutter beam, and the movement is provided by one set of said two V-beam actuator sets via link beam; said moveable translation link and a link beam form a spatial joint, thereby one set of V-beam actuators push the shutter beam with buckle beam springs to move

from one initial stable position to the second stable position in terms of moveable translation mechanism; furthermore, the other set of V-beam actuators pull the shutter beam with buckle beam springs to move from the second stable position back to the initial stable position in terms of moveable translation mechanism, then the bi-stable switching function of optical switch is achieved; in addition, the V-beam actuators of the optical switch comprises two sets of V-beam actuators is connected to each other via a link beam and is located at one side of the shutter beam, and each V-beam actuator set has opposite arched-direction. The forward moving displacement generated by one set of the two sets of V-beam actuators produces push and pull actions to the moveable translation link via said link beam to enable the shutter beam and reflective mirror shutter move from one stable position to the another stable position.

15. The optical switch as claimed in claim 13, wherein a moveable translation mechanism of said optical switch comprises a moveable translation link structure at one end of said shutter beam, and the movement is provided by one set of the two V-beam actuator sets via link beam; said moveable translation link and a link beam form a spatial joint; thereby one set of V-beam actuators pull the shutter beam with buckle beam springs to move from one initial stable position to a second stable position in terms of moveable translation mechanism; furthermore, the other set of V-beam

actuators push the shutter beam with buckle beam springs to move from the second stable position back to the initial stable position in terms of moveable translation mechanism, then the bi-stable switching function of optical switch is achieved ; in addition, the V-beam actuators of the optical switch comprising two sets of V-beam actuators is connected to each other via a link beam and is located at one side of the shutter beam, and each V-beam actuator set has opposite arched-direction; while the forward moving displacement generated by one set of the two sets of V-beam actuators produces push and pull actions to the moveable translation link via said link beam to enable the shutter beam and reflective mirror shutter to move from one stable position to another stable position.

16. The optical switch as claimed in claim 13, wherein the V-beam actuators of the optical switch comprising two sets of V-beam actuators is connected to each other via a link beam and is located at one side of said shutter beam, and each V-beam actuator set has opposite arched-direction and their arched-direction are toward outside the direction of each other.

17. The optical switch as claimed in claim 13, wherein the V-beam actuators of the optical switch comprise two sets of V-beam actuators connected to each other via a link beam and located at one side of said shutter beam, and each V-beam actuator set has opposite arched-direction and their arched-direction are toward each other.

18. The optical switch as claimed in claim 13, wherein the operation state of the optical switch regarding input optical signals is transmitted forward to output channels at the initial state and switch-off state for said optical switch, while the input optical signals is reflected by said reflective mirror shutter toward output channels at the second stable state and switch-on state for said optical switch.

19. The optical switch as claimed in claim 13, wherein the operation state of said optical switch regarding input optical signals is reflected by said reflective mirror shutter toward output channels at the initial state and switch-off state for the optical switch, while the input optical signals is transmitted forward to output channels at the second stable state and switch-on state for the optical switch.